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USEFUL RECEIPTS.

Plaster Casts of Leaves and Flowers.

The leaf, as early as convenient after being gathered, is to be laid on fine-grained moist sand, in a perfectly natural position, with that surface uppermost which is to form the cast, and to be banked up by sand, in order that it may be perfectly supported. It is then, by means of a broad camel-hair brush, to be covered over with a thin coating of wax and Burgundy pitch, rendered fluid by heat. The leaf is now to be removed from the sand, and dipped in cold water, the wax becomes hard, and sufficiently tough to allow the leaf to be ripped off, without altering its form. This being done, the wax mould is placed in moist sand, and banked up as the leaf itself was previously; it is then covered with plaster of Paris, made thin, due care being taken that the plaster be nicely pressed into all the interstices of the mould, by means of a camel-hair brush. As soon as the plaster has set, the warmth thus produced softens the wax, which in consequence of the moisture of the plaster, is prevented from adhering to it, and with a little dexterity it may be rolled up, parting completely from the cast, without injuring it in the least.

Casts obtained in the manner thus described are very perfect, possessing a high relief, and form excellent models, either for the draughtsman or for the moulder of architectural ornaments.

Tanned Gelatine or Artificial Horn.

A manufactory has been established in Paris for the construction of a variety of ornamental articles with this substance. The gelatine is usually obtained from bones by treating them with a weak solution of muriatic acid, and is afterwards tanned by the common process, as in making leather. Upon becoming hard and dry, it assumes the appearance of horn or tortoise-shell, and is employed for the same purposes as those natural productions. It is softened by being boiled in water with potash, when it may be formed into any shape, and the figure preserved by drying the articles between moulds. In the soft state, it may also be inlaid with gold, silver, or other, metals, and it may be streaked with various colored materials, so as to resemble the finest and most beautiful woods. It is probable that this substance will soon be brought very extensively into use, on account of its elegance and cheapness.

Prof. Wright.

Prof. Wright, of Cincinnati, who has contributed for our colums the substance of his able, useful, and instructive lectures on chemistry, is at present prevented from completing the series by severe indisposition. We regret this, and so will all our readers, for his sake and the cause of science. We hope he will soon be restored to health.

It is proposed to build a wire suspension bridge over the river St. Lawrence near Quebec, at a height of 162 feet above high water mark

KEELER'S PATENT SMUT MACHINE.

Figure 1.

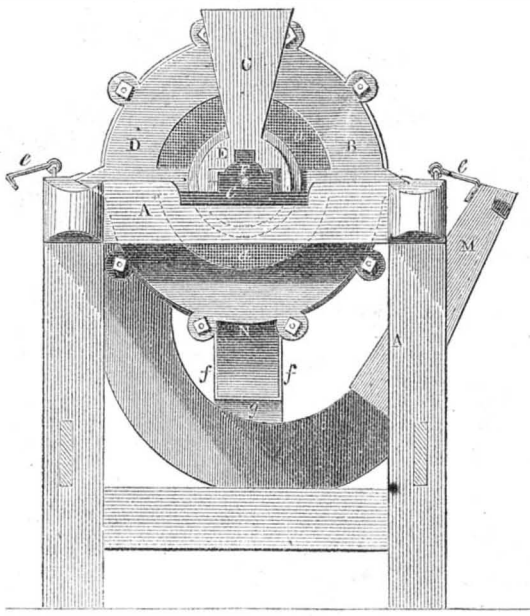
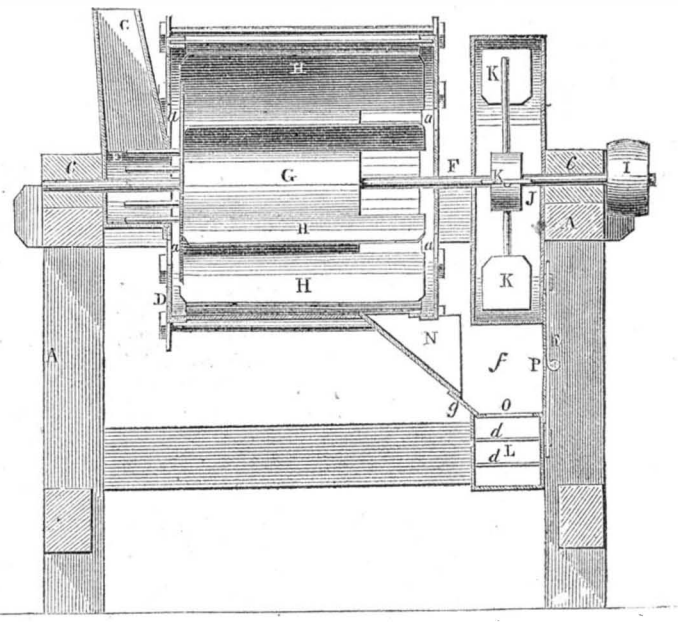


Figure 2.



The annexed engravings are views of an improvement in Smut Machines, invented by Charles and James Keeler, of Union, Broome Co., N. Y., and for which a patent was granted on the 14th of Sept., 1852.

Figure 1 is an end elevation; figure 2 is a longitudinal vertical section of the same taken through the wind chest and passages. Similar letters refer to like parts. The nature of the invention consists in constructing the wind passages and spouts in such a manner as to allow of their being turned to either side to allow the machine to be driven in either direction.

A is the frame of the machine; B is the drum having openings, *a a*, in each end, D, covered by wire gauze or other material pervious to air; its periphery is formed in the same manner as that of other smut machine drums; C is the hopper, and E, a cylindrical box connected to the same, and surrounding the shaft. There is an opening in the end of the drum to which the box is attached, corresponding in size with the said box; F is the shaft passing through the centre of the drum and resting in bearings, *c c*; it carries the beater cylinder, G, provided with beaters, H H, of well-known form, and with a pulley, I, which receives motion through the endless band; J is the wind chest which is formed in two parts: the lips, of the upper half, rest upon the top of the frame and are secured by buttons or other fastenings to hold it in its place; there are similar lips for the lower half which is secured in a similar manner, so that the entire wind chest can be released from the frame without disturbing any other part of the machine; K K are fans secured to shaft, F, and L is the wind pipe divided by partitions, *d d*, into three passages; it descends from one side of the wind chest and curving under it turns upwards; the partitions extend to the lowest part of the bend. In the bottom of the bend there are two openings.—A moveable spout, M, is fitted to the end of the wind pipe, being secured at its upper end by a hook fastening, *e*, to the frame, A; N is a spout inclining from the bottom of the drum towards the wind pipe, and O is an opening in the upper side of the wind pipe below the said spout; P is a plate having two others, *f f*, attached which are at such a distance apart as to fit close to the sides of the spout, N, and are of sufficient depth to fit between the bottom of the wind chest and the top of the wind pipe; a plate, *g*, placed across, *f f*, fits to the bottom of the spout, the plate, P, fits close up to the wind chest and wind pipe, and with the plates attached forms a drawer which makes a movable continuation of the spout, N, to the opening, O. The drawer is secured in place by a sliding bolt, *k*. When the wind spout is turned to the opposite side of the frame, another drawer similar to this, but of a reverse form, is substituted, the one being right handed and the other left handed.

The grain is fed into the hopper, C, and passing through the box, E, into the drum, is subjected to the action of the beaters. Currents of air are caused by the partial vacuum produced by the revolution of the beaters to enter the openings, *a a*. The grain, after the separation of the smut is effected by the beaters, passes down the spout, N, and through the drawer, and enters the wind-pipe through the opening, O; in the wind-pipe it is met by the blast which carries all the smut, dust, and other extraneous matter, which did not pass through the side of the drum, up the spout, M, from which it is discharged, the grain falling out through the openings, *h h*.—This operation, except that the air is admitted at each end of the drum is substantially the same as that of other machines. In other machines, however, it is not usual to provide for driving in either direction, and no provision is made for changing the position of the wind pipe and appendages with any degree of facility, while this can be made a right-handed or left-handed machine in the following manner. The spout, M, can be lifted off by merely unfastening the hook fastener, *e*; and the drawer, P, *f f*, *g*, can be removed when the belt, *k*, is withdrawn, the buttons or fastenings which hold the lower half of the wind chest in its place to the underside of the frame may then be released, when it and the wind-pipe can be taken from the frame and turned round so as to make the pipe turn to the opposite side, and there secured by the buttons as before, the spout, M, can then be replaced and the reverse sided drawer, P, *f f*, *g*, substituted for the one before used, and being secured by the bolt, *k*, the machine is ready for operation in the contrary direction.

Many patents for grain cleaning machines have been taken out in our country, each claiming some advantage. The only way whereby our farmers can judge of their merits, or even know any thing about them, is by seeing them operate, or by engravings and descriptions of them, from which a very good idea of their nature and merits can be obtained. Those who publish illustrated descriptions of their inventions, show they are not afraid to bring the matter before the public. More information may be obtained by letter addressed to the inventors.

The Marston Rifle in England.

In number 17, this Vol., "Scientific American," we presented an illustrated description of the breech-loading rifle of Wm. W. Marston, of this city, and stated at the time, that it was "the most simple and best breech loading rifle yet presented." We also stated that the cartridges obviated the necessity of cleaning out the barrel, and that "it would shine bright inside after firing a thousand shots."

Since the time we made use of these quoted words, they have been confirmed in correctness by trials which have taken place at Woolwich, in England. We learn by the "London Expositor," (the Times and other leading papers confirm the accounts) that Messrs. Moulton & Eustis, from this city, (N. Y.) experimented with the Marston rifle on the 17th of January, at the Royal Arsenal, Woolwich, in the presence of Sir Henry Hardinge, Commander in Chief of the British forces, and other generals and officers of distinction. On the first trial, persons unaccustomed to the use of this rifle, fired 100 shots in 15 minutes, and after firing a thousand shots the bore was perfectly clean. The "Expositor" says, "it seems the most formidable, simply constructed, and economical rifle that has yet been produced." Full credit is given to American inventive genius for producing this formidable rifle. The principle of loading is as applicable to muskets, pistols, fowling-pieces, &c., as to rifles.

Swiss Central Railroad.

There is a project on foot in Switzerland, Europe, to build a central railway, with several branches, which will unite Basle, Berne, Zurich, and Lucerne, and unite the Geneva line. A company has been formed and a charter granted by the cantons.

The Ericsson Lecture in Boston.

Can any of our friends in Boston give us an abstract of Prof. Pierce's lecture before the American Academy of Sciences on the Ericsson ship, wherein he proved that it moved with half a pound pressure below 0, on the square inch.

The people in Canada complain that the mails from the United States are delayed beyond endurance. They have sent a Commissioner to Washington about it.

Australian gold is said to be worth more than £4 per ounce.

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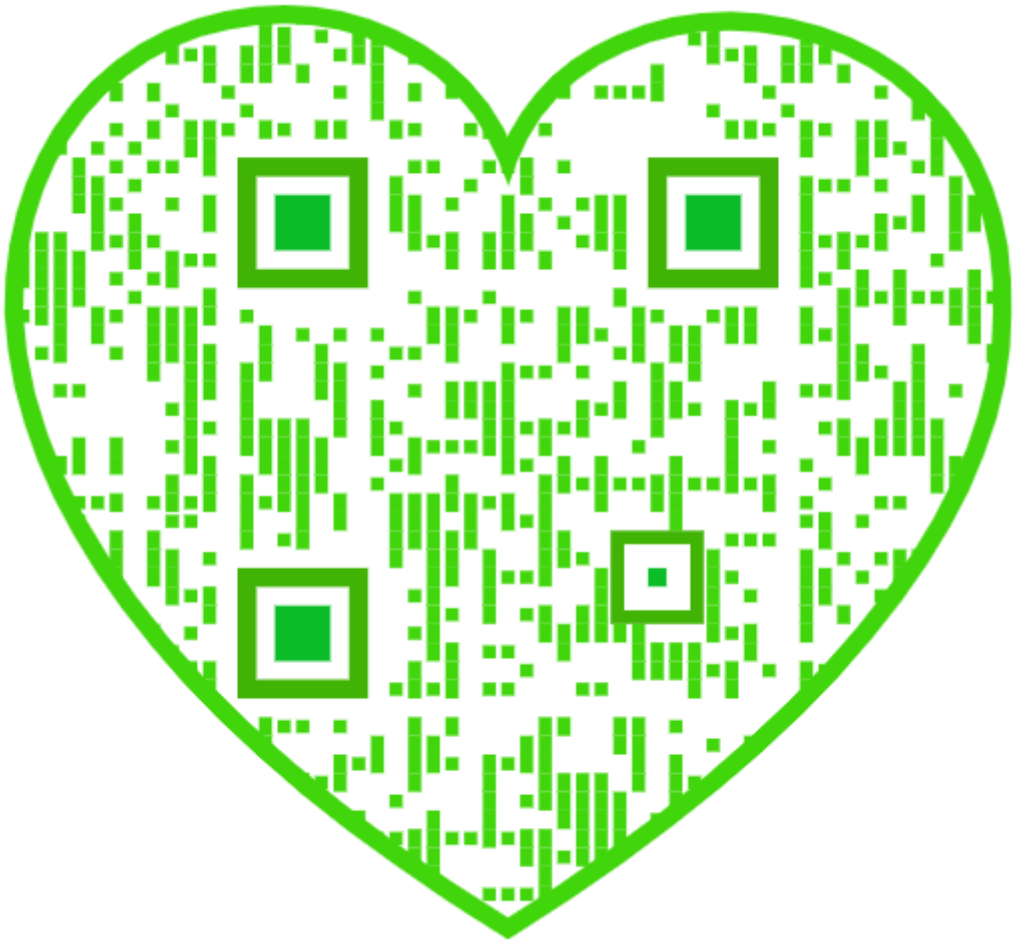
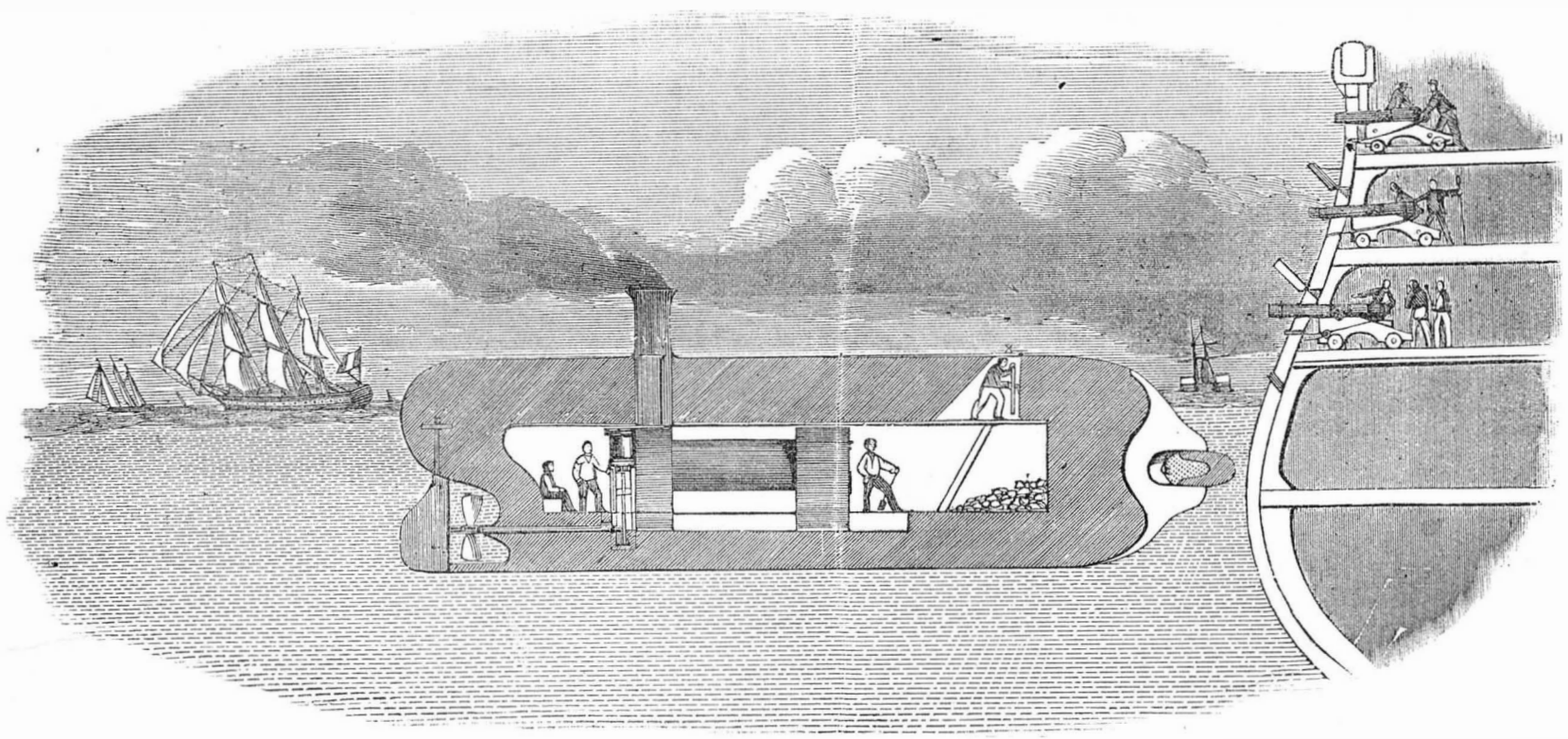


SUBMARINE MORTAR FRIGATE.---Figure 1.



The annexed engravings are views of a floating, partly submerged Propeller, Torpedo Vessel, proposed by James Nasmyth, of Patricroft, England, for destroying large ships of an invading fleet.

Figure 1 shows the Floating Mortar, steered by the man at the sight hole, X, and shown attacking the enemy. Figure 2 is an enlarged view of the Great Brass Mortar and Shell. The cap, C, explodes the instant it is brought in contact with the breech, R; this it does in consequence of the protruding end of the shell being crushed against the side of the enemy. The flange, S S, is just so strong as to resist any ordinary pressure, and is thereby made safe till crushed back by contact with the side of the enemy.

Figure 3 is a transverse section of the Mortar.

Mr. Nasmyth is the inventor of the steam hammer, which bears his name, and various other useful inventions, and besides he is a first rate astronomer and mathematician.—The following is his own account of the invention, which was sent to the "Illustrated News."

The principles on which the arrangement and construction of the floating mortar is based, consist in the first place of a monster self-exploding shell, so arranged as to explode on having its breech end crushed against the breech of the mortar, the self-exploding cap being situated there, as will be seen on reference to the engraving.

In order to enhance the destructive effect upon the enemy's ship, the shell is so far submerged as to tear its way into the enemy six feet under water-line.

Next, to protect the shell from the effect of the water while resting in the chamber of the mortar, it is rendered water-proof, by being inclosed within a perfectly water-tight copper case, which will so effectively secure it from the action of the water, as that it may remain, if need be, for years in the chamber of the mortar, submerged, as before said, six feet under water-line, and ready for service at any time.

The crush consequent on coming in contact with the side of the enemy is the agent whereby the monster shell is made to explode. A very moderate velocity of the Floating mortar would, when brought up against the side of the enemy, prove sufficient for this purpose; so much so, that, in order to obviate the chance of its explosion by accidental contact with any other object, I have so placed the flange joint of the copper case against the mouth of the mortar, that the crush against the side of the enemy, resulting from a speed of two or three miles per hour, shall be sufficient to overcome the resistance of this flange, and crush the self-exploding cap at the breech end of the shell against that of the mortar, and so cause it to explode and tear its fearful way through the side of the enemy. Thus it will be evident that we can never fail to render the shell effective, in as much as that it is the very fact of contact with the side or hull of the enemy that brings the self-exploding agency into action. No ship that has ever been built, either wood or iron, could survive the fearful hole which a monster shell, exploded under such circumstances, would produce.

The next feature is the intimate union of our mortar with the hull of the screw steam-vessel, which transports it direct to the object which we desire to destroy. The mortar is (as will be seen on reference to the engraving) made part and parcel of the vessel, and so situated as to unite the most effective mechanical arrangement with the strongest position of the vessel—viz., "end on," so that the entire mass of our vessel (mortar and all) is brought into play, as the means whereby the concussion or recoil due to the explosion of the shell is absorbed by the entire mass of the floating mortar, so that no sensible recoil or concussion would be experienced.

Next is the manner in which the crew who attend to the navigation of the floating mortar, together with the steam-engine, boiler, and screw, are protected from the action of shot, whether red-hot or cold. This object is attained by giving the vessel, in all directions where assailable, such a thickness of timber as that no shot, of whatsoever description can penetrate to the interior. To insure this, the hull of our floating mortar will be made at least ten feet thick, of poplar wood, which material is admirably adapted for the purpose, by reason of its lightness, toughness, and incombustibility. Red-hot shot might lodge in it, but would fail to set it on fire.—A red-hot shot would only char a few inches of the timber around it and cool at its leisure, and from the extent to which the hull would be submerged, the portion above water presents no surface favorable for the effective action of shot; whilst, as there will be most ample accommodation in the interior for a high pressure engine and boiler, with direct action screw-propeller, there is nothing to prevent our obtaining a velocity of eight or nine miles an hour, although for the actual objects of the vessel a speed of five or six miles would be ample. The draught of the engine furnace would cause perfect ventilation for the crew, which need not consist of more than three or four handy men.

I would observe, in conclusion, that as this class of vessel is chiefly designed for defence against invasion, and would not have to act against an enemy, probably, at greater distances than one or two miles from our shore, it could speedily return for another shell; the means for lodging which in the chamber of the submerged mortar are most simple, but not needful at present to describe. I conceive, however, that the total destruction of one enemy's ship at each trip would be sufficient service.

Three or four such floating mortars, each of which sending to the bottom of the sea the largest ships an invading enemy might dare to bring towards our shore, would make such a demonstration as would strike terror into the largest fleet that molested a peaceful nation; and not fail to confirm the maxim, that the best way to prevent war is to render the results so terrible as that evil-disposed nations will think twice ere they face such wholesale destruction as our floating mortars would not fail to deal out to them.

[The fear of an invasion has been very strong in the minds of the people of Britain ever since Louis Napoleon became President of France, and at present the excitement, we can perceive, is approaching fever heat. It was said once, that "a sight of the gray coat of Napoleon (the great we mean) was enough to set all Europe in an uproar." We must say that England seems afraid now in trusting in her wooden walls, and instead of terrifying her foes by keeping watch and ward on their coasts, as she once did, she is keeping a sharp look-out for the defence of her own coasts by such water hogs as this of Mr. Nasmyth. Prudence, no doubt, is the better part of valor, but we apprehend that this vessel could very easily be taken prisoner by a few boats before it was permitted to drive its snout against the side of an invading war ship. It no doubt could be used at night as well as during day light; but at the same time, we must say that since Mr. Nasmyth has brought this subject before the public, invading ships will be prepared for it, as they now understand what it is.

Torpedo submarine vessels are not new; more than one has been invented in America, and for many years they formed a more interesting subject to Robert Fulton than his steamboat. He was furnished with means by Napoleon to blow up an English frigate, but failed, and after that Napoleon seemed to entertain a prejudice against him. Lord Cochrane invented a torpedo submarine vessel, but nothing of any consequence, so far a we are informed, resulted from it, and neve will, we suppose.

Figure 2.

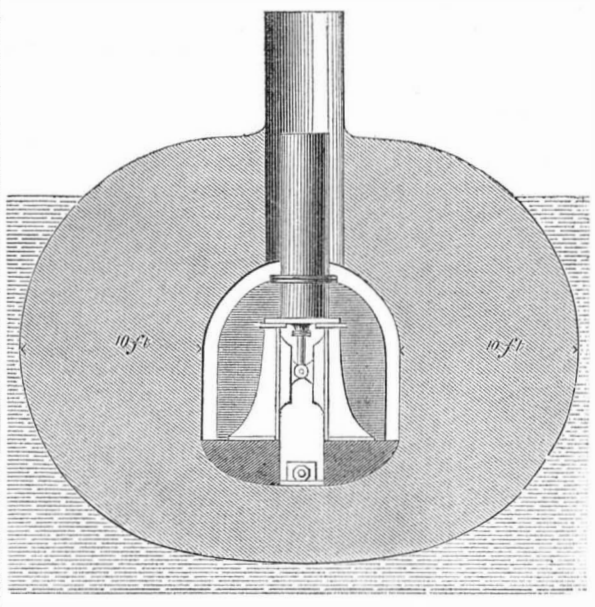
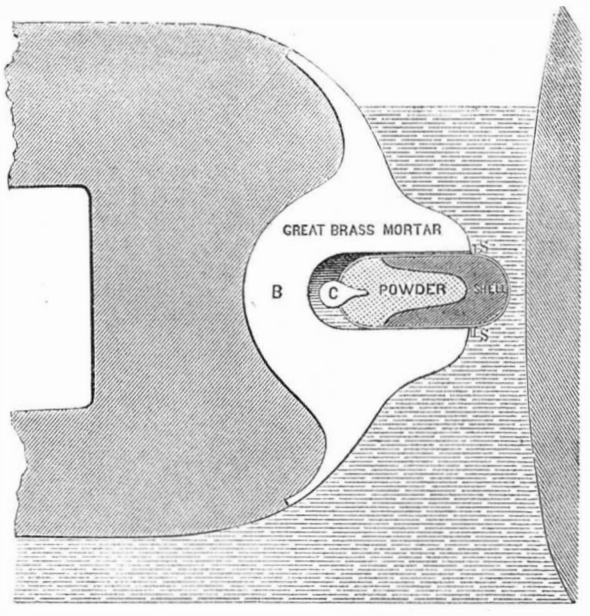


Figure 3.



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Machinery and Tools as they are.---Saws and Saw Mills..

(Continued from page 171)

There are mainly two distinct plans adopted in the application of the Saw, when it is removed from the hands of the artizan or workman, and intrusted to the guidance of rods or pulleys. Upright or reciprocating saw machines are largely employed to perform that kind of sawing which was formerly done at the saw pit, the larger upright saws are used for cutting round or square timber into thick planks, the smaller for cutting deals into boards. The framing of the earlier of these machines was mostly formed of wood, a material which still prevails for this purpose in many districts, although the best are now made entirely of iron. But the circular saw is rapidly gaining ground as a competitor over the straight saw, and is manufactured of as large a size as 6 feet in diameter. Other forms of this tool are sometimes used, although their employment is not general; for instance, we find for many small articles, that several variations of the "trephine saw" are employed under the names of crown, annular, curvilinear, drum, &c. Still, whatever the nature of the work, it may be classed under one of three varieties, according as the saw cuts the lengthway of the grain, across it, or in a curvilinear direction. Reverting to the upright saw machines, the leading principles of their construction are but slightly varied, the intended purpose is to give an alternate vertical movement to the saws, whilst, at the same time, a slow progressive horizontal motion is imparted to the table which supports the timber to be sawn. For this purpose two standards or upright beams support the guide bars down which the saw frame slides, while the frame itself is made sufficiently large to accommodate several saws, sometimes as many as eleven being employed, so that twelve boards can be produced from one plank. The frame keeps the blades straight, gives them tension, and enables the force to be applied without the risk of injury. The distances between the blades are adjusted by interposing pieces of wood and pressing the whole together by side screws, after which the saws are separately tightened by steel wedges. To allow of this adjustment, the saws have buckles rivetted to them, and these generally pass through mortices in the top and bottom rails of the sliding frame. This latter has appropriate bearings at the four angles, to fit the slide bars, and the alternate motion is given to it by a crank shaft; the connecting rods are not attached directly to the saw frame, but to a cross-head which is jointed at its centre to the frame, so that even supposing the two cranks to be a little dissimilar in length or angular position, they nevertheless move the frame equally without straining or rocking it. The advantage of a long connecting rod entails the necessity of allowing great depth to the standards which sometimes measure eighteen feet in height, and in order to bring the machinery into more moderate compass, it is proposed to use a forked connecting rod. The friction caused by the rapid motion of the saw frame, is very considerable, so that the guides require to be well adjusted. The timber lies on a bed which is placed on a series of rollers, and is made to advance towards the saws by means of a rack and pinion, which are actuated by a ratchet movement, so that when the retaining pawls are turned back a retrograde motion can be given to the bed. It is possible to dispense with the long rack by grasping the timber between two grooved feeding rollers, the one fixed to the framing of the machine, the other pressed up by a loaded lever, and moved a small step at each time by a ratchet, as usual, but this plan does not prevail. The balk is held in its right position by dogs, and in some machines, both these and the timber can be moved in transverse directions to suit the varying widths of the lumber.

At the City of London Saw Mills the machine for cutting logs or balks of timber into thin veneer planks, is very accurate—in one instance,—a log of Honduras mahogany, 18 feet long and 3 feet 1 inch square, was cut into unbroken sheets at the rate of ten to an inch, and so beautifully smooth as to require scarcely any dressing.

Reciprocating saws are much used for curvilinear works, such as bevelled timber for ship-building, felloes of wheels, circular rails of chair backs, &c. For these it is usual to have a narrow saw moving vertically, whilst the bed is capable of motion in various directions. In some cases the work can be guided by a fixed circular fence or by radius bars; for bevelled works the table can be tilted to any angle, and for such adjustment it appears preferable to allow it to swing on a central joint. In other cases the saw frame is jointed and may be brought down by a swing frame in the arc of a circle, to penetrate to any assigned depth.

Small reciprocating saw machines, fitted up as adjuncts to the lathe, are often found advantageous to mechanics using that tool and occasionally cutting curved work. In one instance the saw is stretched in a frame about 4 to 6 inches high, and from 10 to 14 inches wide, a small pulley beneath the lathe-bearers receives continuous motion from the foot wheel, the end of a cord is fixed to the pulley at a small distance from the centre, the other end is passed beneath another small pulley, and carried on to the frame, which is forced upward by a spiral spring, and then pulled down by the cord. In other small machines the saw is unprovided with the frame, by which it is generally stretched and guided, these functions being fulfilled by the motive part of the apparatus, one instrument of this sort has a spring attached to each end of the saw, and a small eccentric gives the motion by fixing a loop of wire, which embraces it, to the lower spring, so that when the eccentric revolves the spring is thrown into rapid vibration, and with care in the arrangement the saw can be made to traverse very nearly through the same point of the platform. These small saws are chiefly adapted for cabinet-makers and others who require to cut thin curvilinear pieces. When the straight saw is used in cross-cutting machines, it is customary to give the frame a horizontal reciprocating and also a vertical feeding motion, and almost to counterpoise the weight, so that a moderate pressure only bears on the saw teeth. The forms of the teeth differ considerably, according to the nature of the work, a tooth often used for cross-cutting is said to be of upright pitch from presenting equal angles on each side, but another kind more generally employed for small cross-cutting saws is inclined about 15° from the last, this is termed slight-pitch; in ordinary pitch the face is perpendicular and the back inclines at an angle of 30° from the edge of the saw; this shape is likewise used for cutting metal, for circular saws, when the work is fine, and often for cross-cut circular saws Sometimes in mill saws for soft woods the face of the teeth is set forward, or stretches beyond the perpendicular at an inclination of 15°, nearly the same tooth is likewise adapted for circular saws, and cutters for metal.

Some teeth are called gullet teeth, on account of the large hollow or gullet that is cut away in front of each tooth in continuation of the face, they are also known as briar teeth. The tooth is, in general, cut by one punch filling the entire space. This shape allows more room for the saw-dust, and is less disposed to retain it than the angular notch so that it is much employed, although the angles of the face and back are varied according to the species of wood, for mahogany, rosewood and other hard woods, and likewise for cross-cutting the angle of the face may be 90° and that of the back 30°, for soft woods and ripping with the grain the angle should be less.

(To be Continued.)

Serious Accident.

A serious accident occurred at Glen Cove, L. I., last week, by which one man was killed, and about thirty more severely wounded. A Magistrate's Court was in session in a small room, and a large number of persons were present as spectators, when the floor gave way, and precipitated one hundred and and fifty persons into the cellar below. A stove full of hot coal fell among the unfortunates, burning some of them severely.

The present naval force of Great Britain consists of five hundred and forty-five ships of war. Of this number one hundred and eighty are armed steamers.

Helichrome or Sun Coloring.

The following is M. Niepce's last address to the French Academy of Sciences, on the above-named subject, which we have translated from the "Lumiere":—

"In this new memoir I shall chiefly treat upon the optical phenomena that I have observed in trying to fix the colors in the camera. After having obtained, by contact, that is to say by applying the plane of a colored engraving on a sensitive plate, and covering it with a glass to expose it afterwards to the light, all that it was possible to obtain in the present state of things, I have sought to arrive at the same results in the camera. The attempt was difficult and I made up my mind to encounter great difficulties, which I have succeeded, to a certain extent, in surmounting.

I have discovered the possibility of copying every color—all that is required for this purpose being a suitable preparation of the plate. I began by copying, in the camera, colored engravings, and afterwards artificial and natural flowers, after this inanimate nature,—a figure which I clothed with garments of different colors, and always with gold and silver lace I obtained every color, and, what is most extraordinary and singular, the gold and silver were depicted with their metallic lustre, as were likewise glass, alabaster, and porcelain, with their peculiar brilliancy. I have produced pictures of precious stones and stained windows, and these attempts have brought under my notice a curious circumstance which I think it proper to mention here. A dark green glass placed before my objective, gave a yellow instead of a green picture, whilst a light green glass placed beside the dark green was copied exactly with its color. The great difficulty that has hitherto stopped me, has been that of obtaining several colors together; it is however possible, for I have often done it.

All light colors are produced much quicker and better than dark colors—that is to say, the nearer colors approach to white the more easily are they copied, and the nearer they approach to black the more difficult it is to copy them. This is to be expected, for their photogenic action is greater according as colors are more luminous. Bodies that reflect most white light are likewise those that are best copied, so that white light, far from being injurious to copying colors, renders it, on the contrary, more easy, as will be seen Having observed that light and brilliant colors are copied much better than dull colors, provided, however, that the former are not exposed to the direct rays of the sun, because, in that case, they would reflect the light like a looking-glass, and burn the picture in certain parts, I conceived the idea of operating in a room, the interior of which should be as much illuminated as possible; for that purpose I employed at first a room papered white. The results have been at least equal to those that the camera gave, as far as regarded the copying of colors, which it was important to prove. After this I covered the inside of a camera with tinned looking-glass, and again obtained the same results, such a camera is, however, contrary to all photogenic laws.

I cannot, nevertheless, certify in a positive manner, that there is really an advantage to use, in preference, an apparatus of these two kinds, either for the force of the effect or for the rapidity, because the means at my disposal have not, as yet, permitted me to make comparative trials sufficiently conclusive.

On account of the light colors being copied more easily, and above all more rapidly than the dark colors, it is of great importance that the shades of the object copied should have shades of a similar tone, if it is required to copy them all at the same time; unless this is the case, the light shades would be obliterated before the next were copied. Colors of different tones can, however, be fixed by taking care to select light dead colors and dark colors that are bright or glassy, which I have done successfuly. The most difficult color to obtain with all the others, is the dark green of foliage, because green rays have little photogenic action, and are almost as inactive as black; light green, however, is very well copied, particularly if it is shining, as in green paper glazed. To obtain dark greens, the plate must be scarcely warmed before exposure to the light; whilst, to obtain most other colors. and particularly fine whites, it is necessary, as I have said elsewhere, that the sensitive coating be brought by heat to a cherry red tint. This red tint has great disadvantages—the dark parts and the shades remain almost red; some times, however, it happens that the dark parts are well expressed, particularly when it is done by contact. I have endeavored, by all the means at present in my power, to do away with this preparation by rise of temperature, but I have not yet succeeded. The following experiments have directed me on a road which will conduct me, I hope, to a complete solution of the problem of HELIOCHROME.

If, when taken out of the bath, the plate is only dried, without raising the temperature so as to change its color, and then exposed to the light with a colored engraving before it, there is actually obtained, after a very short time of exposure, a copy of the engraving with all the colors. But the colors, most commonly, are not visible, some only appear when the exposure to the light has been long enough, namely, the greens, reds, and sometimes the blues; the other colors, and frequently all the colors, although for certain produced, remain latent. The following is a proof of this: if a small ball of cotton, impregnated with ammonia, and that has already been used for cleaning a plate, is taken, and the plate gently rubbed with it, the picture will gradually appear with all its colors. For this purpose it is necessary to take off the surface coating of chloride of silver, to get at the lower coating below, namely, the one that adheres directly to the silver plate, and on which the picture is formed. It is clear from this that the only question is to find a substance that can develope the picture and that will, perhaps, at the same time fix the colors. The problem would then be completely solved. In the numerous experiments made for this purpose, I have observed, if the vapor of mercury is employed, the picture is very well developed, but it is of a uniform gray tint without any trace of color; its appearance differs from that of the Daguerream picture, although like the latter it is presented under two different aspects, that is to say, a positive picture, in one sense, and a negative in the other. If a weak solution of gallic acid, with a few drops of ammonia is used, the picture is similarly made to appear, especially when the plate is heated and afterwards dried without washing. The picture which then appears, resembles, in some degree that produced by mercury, and if to the gallic acid there are added a few drops of aceto-nitrate of silver, it becomes almost black. The time of exposure necessary to obtain the colors varies considerably, according to the manner of preparing the plate; I have already shortened it, for I have taken pictures in the sun with a German objective for a half plate, in less than a quarter of an hour, and with diffused light in less than an hour. The colors fade more quickly, according as the plate is more sensitive, and hitherto I have only succeeded in fixing the colors momentarily, the question of permanent fixing has yet to be resolved; it is connected, perhaps, as I have pointed out above, with the discovery of a substance that will transfer the picture from its latent to its visible state. Notwithstanding what remains to be done, I believe that I have already obtained extraordinary results, which have surprised every one to whom I have showed pictures of the figure copied by me, in which the gold and silver lace is depicted with its metallic brilliancy, and in which the contour of the figure and all the colors of the clothes are copied with much clearness. My best pictures already realize, in part, the enthusiastic expectations of my uncle, who said to one of his friends, the Marquis de Jouffry, that one day he would take his picture the same as seen in a looking-glass. This vast advancement has unfortunately, not yet been attained, but we may hope to arrive at it some day or other, and although the difficulties to be overcome are still numerous and great, I have placed, it appears to me, out of doubt the possibility of complete success."

The stock of hemp in St. Louis, is stated to be only one hundred and twenty five bales, and held at $115.

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NEW INVENTIONS.

Improved Omnibus Lamp.

Measures to secure a patent for an improved Omnibus Lamp have been taken by F. O. Deschamps, of Philadelphia, Pa. The improvement consists in placing the lamp within a case, the lower part of which is formed of glass, and the upper part of a metal cap furnished with a lens. The case is inserted in the top or roof of the omnibus, having the lower or glass portion within, and the upper or metal part outside. The lamp will, therefore, serve the purposes both of lighting the interior and likewise the driver when taking the fare of the passengers, this latter purpose being effected by means of the lens which reflects a light upon any required focus. This focus, ot course, would be the money-box, for the driver by the present arrangement is subjected to much inconvenience from a deficiency and often total want of light, when taking money or giving change.

Beef-Steak Machine.

Every one, undoubtedly, has experienced the inconvenience of dining on a tough beef-steak,—a machine for the purpose of rendering this viand as tender, after going through the process, as it was before the operation the reverse, has been invented by John Lyon, of Enfield, N. H., who has taken measures to secure a patent. The machine consists of two corrugated rollers, one of which is adjustable, arranged in sliding bearings and placed horizontally one above the other, between which the steak is passed. The upper roller is connected to springs by means of vertical adjusting screw rods, so that it will suit itself to steaks of varying thickness. The apparatus is enclosed in an iron frame, and the rollers are set in motion by cog-gearing, which is operated by a crank.

New Printing Press.

We learn by the "Pittsfield (Illinois) Free Press," that John G. Nicholay, who recently obtained a patent for an improvement in Rotary Printing Presses, has been employed for several years in the office of said paper, the editor of which, J. M, Parkes, Esq., speaks of it in the most flattering terms. He believes it will not cost more than one half the price of the common "power-press," while it will work much faster and do better work.

The town of Rutland, Vt., is said to have turned out a million dollars' worth of marble the past year.

An attempt to light the town of Basle, in Switzerland, with gas from carbonized wood has entirely failed.

SAFETY CAR FOR INCLINED PLANES.

Figure 1.

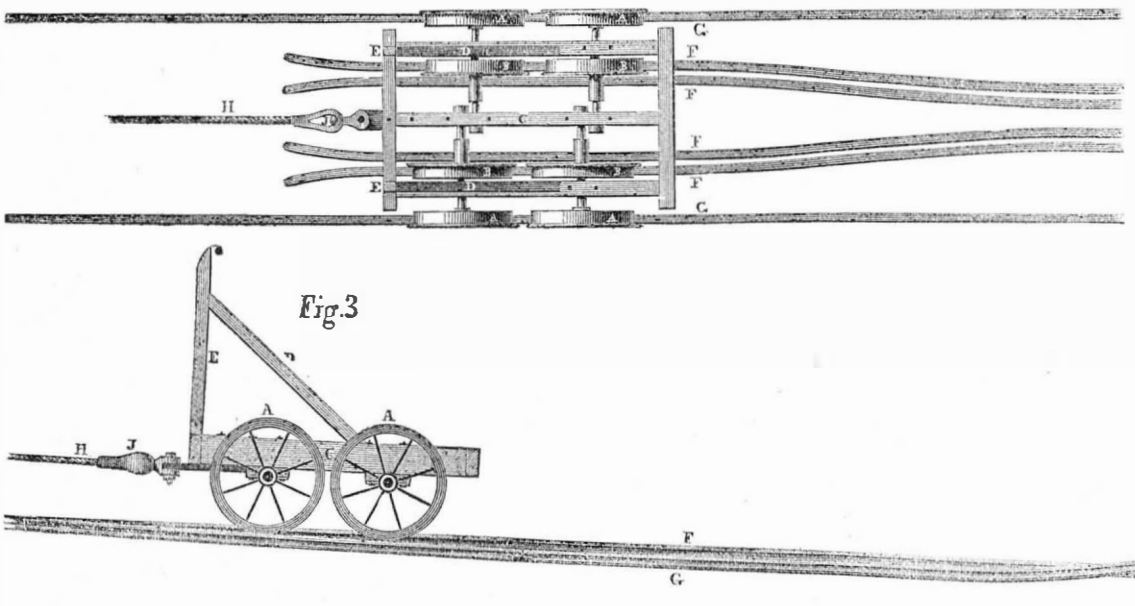
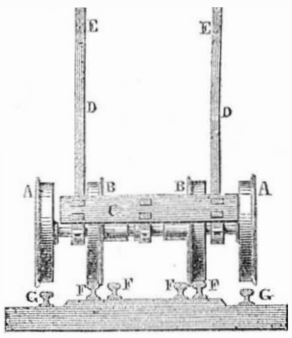


Figure 2.



The annexed engraving illustrates a new Safety Car, (so called,) invented and patented on the 12th of last October, 1852, by Samuel McElfatrick, of Fort Wayne, Ind.

The object of the invention is to facilitate and cheapen the passage of cars upon inclined planes, and is especially applicable to the coal fields of our country where this mode of transportation is necessarily much in use.—Figure 1 represents a plan of car and tracks. Figure 2 represents an end elevation of the same. Figure 3 represents a side elevation of the same. The same letters refer to like parts. The ordinary plan of passing coal wagons over inclined planes is by coupling them together and attaching the upper car to the plane rope. This method is the fruitful cause of loss to life and property owing both to the breakage of the eye bolts by which the cars are coupled (the strain on each bolt being in proportion to the number of cars depending upon it) and also to imperfect connections, it being scarcely possible but that where so many cars are to be connected and disconnected, there should be occasionally a pin omitted or not properly placed. The rope is also liable to damage when unhooked and thrown upon the track at both ends of the plane, and the labor of connecting and disconnecting cars is a very serious item of expense upon a large business. This invention remedies all the difficulties, and is so simple and cheap in its arrangement that it must commend itself to those engaged in the coal business, and wherever inclined planes are used.

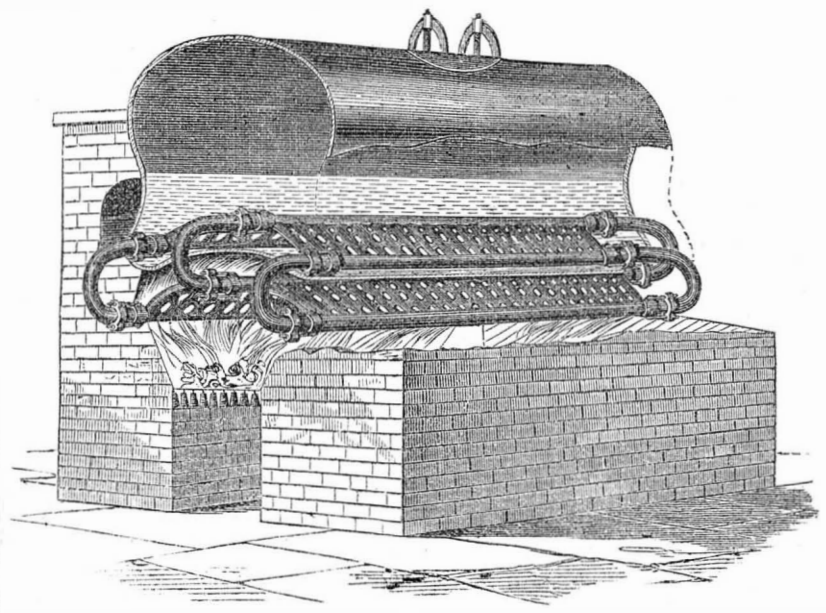
The Safety Car consists of a strong oak frame, C, permanently attached to the rope, H, by the swivel, J, and carrying two posts or horns, E E, against which the train abuts. The frame, C, rests on four short sliding axles, to each of which are fastened two wheels; those marked A A A A, to run on the main track, G, and B B B B, to run on the converging track, F, at the foot of the plane. The operation of this car will be very readily understood; the train to descend abuts against the horns, E E, and passes down the plane, when near these foot the wheels B B B B, of the safety car, take the track, F F, which, by gradually rising (as compared with the main track) lifts the wheels, A A A A, which are drawn over and within the main track by the convergence of the rails, F F. When the safety car is brought into this position the track, F F, by descending rapidly carries it into a pit and allows the train to pass over it. The train to go up is placed at the foot of the plane, and the safety car in rising out of the pit shifts its track and carries the train up before it.

Any information in regard to the above invention, may be obtained of the inventor at Fort Wayne, Ind., or of G. W. Campbell, 232 Pearl street, this city, N. Y.

New Steam Boiler.

The annexed engraving is a perspective view with one side in section, of a steam boiler patented by a Mr. Wright, in England and illustrated in the "London Expositor and Mining Journal," who say that "in experiments conducted with care before several engineers and scientific men, it has shown an evaporative power of upwards of 12 lbs. of water for one of coal." This is about 4½ lbs. of water more than is evaporated by a pound of coal by our best marine boilers. The improvement consists in applying to the boilers of engines, or other vessels for evaporating or heating fluids, a cellular apparatus, such as may be easily understood by the engraving.

"They are constructed of malleable cast-iron, and are hollow throughout; one such set of tubes being placed underneath the boiler, over the fire, and two other sets within the boiler; they are connected together by bent tubes, as shown, so that all the tubes have a free communication with each other, but the water contained in them is insulated, and is, therefore, distinct from that in the boiler, by which means it can be raised to a temperature of 400° or 500° Fah., without being converted into steam. The general size of the boiler, which is of the wagon form, without a flue, is 6 feet 9 inches long, 3 feet 6 inches wide, and 2 feet 6 inches high; the area of the bottom is about 21 superficial feet. It is set with brick flues, so as to circulate the heat round the concave sides and the ends, being in this respect like an ordinary boiler. The flue surface is about 23 feet area. The area of the cellular plates exposed to the direct action of the fire is about 25 feet, and that of the plates within the boiler about 23 feet. The fire-bar surface is equal to 4 square feet. The quantity of water in the boiler is about 1,500 lbs, and that contained in the cellular vessels about seven galllons. The quantity of water evaporated by this boiler is about 12 cubic feet per hour, making it capable of raising steam sufficient for a 12 horse-



power engine, although its dimensions are only equal to that of an ordinary 4 horse-power boiler.

By this arrangement the flame can only impinge on the boiler through the perforations in the cellular vessels, and all remaining caloric passes over the bridge, and among the remaining portions of the tubes, causing the insulated water therein, to take up a large portion of the heat, which heated water circulates through the tubes within the boiler, when the excess of caloric is instantly given off to the water contained in the boiler, and the insulated water having thus parted with its heat, descends, being replaced by the ascending current of heated water, and which in turn gives off its excess, and again descends. Thus a constant circulation of the insulated water is kept up through the cells and tubes, which water is the receiver and transmitter of heat, instead of the caloric or the fire acting directly on the boiler."

[This description from our cotemporary the "Expositor" presents the idea clearly, that the isolated water in the cellular apparatus and tubes, is made to heat the water in the boiler, by absorption through the tubes. We cannot see what advantage is thus obtained over the common direct exposure to the fire of the water to be converted into steam, in the main boiler.

The Patent Fund.

We see by the proceedings of the United States Agricultural Society, that the executive committee "have prepared a memorial to be presented to Congress asking for a portion of the money now annually appropriated to the Patent Office, for the Agricultural Report, and the collection and distribution of seeds."

We hope this does not mean the money voted out of the patent fund. There should be an agricultural department at Washington, apart from the department of inventions.—We hope that no money will be granted to any society for any such purpose; let the money, as it has been, be under the control of government, but let it be controlled in a different manner, and under a different organization.

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Scientific American

NEW-YORK, FEBRUARY 19, 1853.

The India Rubber Case Again---Extension of the Patent.

On the 24th day of February, 1839 Nathaniel Hayward, of Woburn, Mass., secured a patent for vulcanizing india rubber by means of sulphur, which patent was assigned to Charles Goodyear—a man of a shrewd and future grasping mind. Some idea of the importance of this improvement may be formed from the fact that it has been a subject of continual litigation for a number of years; yea, almost since the day the patent was issued. It is the real vulcanizing substance now used in the manufacture of india rubber fabrics of every description. The claim is in these words, "the combining of sulphur with gum elastic, whether in solution or in substance either by mixing with the digested india rubber, kneading it, or sprinkling it on the surface of sheets and pressing it in."

The conspicuous litigants have been Goodyear, versus Horace H. Day. Daniel Webster distinguished himself not many months before he departed from this earth, on the side of the complainant, before Judge Grier, at Trenton, N. J. That was a famous court scene; there were Webster and Choate, of Massachusetts, engaged in legal conflict "with eye to eye and foot to foot opposed." The fame of such legal champions brought together a crowd of admiring and wondering listners, who "ne'er shall look upon the like again." The result of that hearing—it was not a trial at law—resulted in victory to the side on which the great deceased lawyer and statesman had devoted his talents and learning, and the result was an injunction to restrain H. H. Day from infringing Goodyear's patent.

As the patent of Hayward expires on the 24th—Thursday next week—it was not to be expected that the proprietors of this patent would calmly suffer it to become public property without an effort to get an extension for seven years. Indeed, we have heard it stated, that the great amount of law business connected with this patent during the past few years was all a well arranged contemplated matter, in order to present a great bill of losses to prove that the inventor, in his agents, had not received sufficient compensation for benefits conferred upon community by the invention. Be that as it may—we cannot credit such stories—the extension was prayed for, and the case has been heard before the Commissioner of patents. It was the most extraordinary hearing for an extension of a patent that has ever been brought to our notice. It continued for eight or nine days, we believe, from the 1st inst. before the Commissioner, and eminent counsel, three or four on each side, were employed by those interested in the patent and those opposed to it. This is the first time that such a mighty quantity of speech making has been presented to a Commissioner of Patents; it shows us something of the value of the invention. But it is only a few weeks since that all the circulars issued from the Patent Office contained these words in reference to the extension of patents, "all arguments must be submitted in writing." That rule has been departed from, and we are afraid that it may lead to an increase of expenses to inventors by opening up a new field for lawyer's fees. It appears, however, that the law, Sec. 18, Act 1836, contemplated that argument—real argument—should be allowed, but it makes provision only for those opposed to the extension. It says, "any person may appear and show cause why said extension should not be granted," but makes mention of the applicant furnishing his petition proofs, and statements in writing only. It appears to us that no provision is made in the Patent Laws for such an exhibition of speaking and oratory, as has lately taken place before the Commissioner of Patents in reference to the extension of this patent. The law is plain that the Commissioner shall *hear and decide upon evidence produced*, both for and against the extension of the patent, but this, in our opinion, has reference only to statements of facts, not speeche; but at the same time it certainly means oral statements; we think there can be no doubt of this, and the present Commissioner has the same right to say how they shall be made, as the previous one to say, "they shall only be in writing." The public, however, should have full information about such things; we are only afraid, as we said before, that this new mode of hearing arguments will lead to a great evil in entailing unnecessary expenses upon inventors.

The great question discussed before the Commissioner was whether he had or had not a right to extend the patent to an assignee. Those opposed to the extension contended that he had no such right, and the applicants contended he had. The law by strict construction says, and means no more and no less, than that the patent is to be extended to the patentee only. There is not a word in section 18, Oct. 1836, about an assignee, and that is the only authority the Commissioner has for his rule and guide.

In England it is not uncommon to extend a patent to an assignee in conjunction with a patentee, but not otherwise, so far as we are informed. It appears to us, however, that an assignee may often suffer injustice from infringers, without recompense by our laws, which grant a man a patent, but do not provide for its enforcement. In England, the Attorney General always appears for the patent plaintiff in the Court of Exchequer, but this is not the case in our patent trials. It is a hard thing for a man to purchase a patent and then have to pay high fees to counsel to bring a case of infringement before the courts of the government which has granted it, whose title deeds have been infringed. Our inventors, we believe, would rather pay $60, or more, for a patent fee, if the United States District Attorneys were by law compelled to pursue infringers. The District Attorneys might get $1,000 per year additional salary from the patent fund, for the performance of extra labor. As it regards the extension of a patent to assignees, however, it appears to us that Congress alone can do this, as no provision is made for an extension to such persons by our Patent Laws.

The Ericsson and our Cotemporaries.

It is well known to our readers that we have expressed our opinion that "hot air as a motive agent can never supersede steam." We have given some reasons for entertaining such an opinion, but not all that might be adduced in support of it. In opinion, we have stood nearly *alone* among the public press of our country; that is, no paper or magazine devoted to news, literature, science, and art, has expressed a decided opinion with arguments attached respecting the success or failure of the Ericsson. What we have said has been expressed calmly and in the most moderate language, but because we have so expressed opinions in opposition to those of some editors who have no scientific knowledge, and who are not capable of passing judgment on such a subject, they have not scrupled at hasty and untrue assertions in speaking of us, although we have given no occasion for personal remarks to any one.

On the 11th of last month (Jan. 1853) the Ericsson made her second trial trip down the New York Bay, with the Corps Editorial of New York City, and on Friday last week the 11th Feb., she was opened for visitors, a month exactly from her trial trip, during which time she has been undergoing repairs at Williamsburgh, or rather getting her finishing touches, Captain Ericsson having stated on her trial trip that "she was not yet fit for going to sea, as her valves and pistons had not been rendered completely air tight." It will no doubt be very difficult to keep them tight, but if any man can do it Capt. Ericsson can. She is now said to be perfected in every part of her machinery, but we cannot forget that on the 12th of last month, the "New York Tribune," warmed with undue excitement, used these words:—"The age of steam is closed, the age of caloric opens, Fulton and Watt belong to the past, Ericsson is the great mechanical genius of the present and future." One month since then has passed away, the Ericsson was lying all that time getting repairs, and we have not heard of a single steamboat striking her colors to hot air.—Every paper in our city used nearly as extravagant language as the "Tribune," especially the "Herald" and "New York Times." Perhaps a month has cooled their imagination and led them to sound reason; it at least has done so to the "Tribune." In that paper of the 11th inst., one month exactly from the day of the Ericsson trial, and thirty days exactly from the time it declared "the age of steam closed," we find these words in a leading editorial:—"Had Capt. Ericsson succeeded in transmitting the moderate force excited under his main pistons to the crank shaft, *the days of steam as a marine motor might perhaps be about to be numbered.*" Here, without any apology for its former wild assertion, "the age of steam is closed," it now says, if all the direct power of the hot air was communicated to the main shaft, (two-thirds more than what it had before,) the age of steam *might* be about numbered. This is certainly coming down *a peg or two*, and not in a very ingenious manner.

We have not seen a solitary scientific argument presented by the hot air advocates in favor of it as a superior substitute for steam, and we are thereby convinced that they are all deficient in scientific knowledge. Now a good argument might be presented in its favor based upon its inferior capacity for heat, which is as 3.72 to 1 against water.—We confess that a good argument could be adduced in its favor based upon its atomical numbers, and as Jonathan Edwards would say about a theological question, "it would look strong until it came to be handled, when it would fall to pieces." We will endeavor to present some arguments for and against it next week, and in the meantime wish the Ericsson a safe and prosperous first voyage.

The Hardware Trade.

Several of the New England Hardware manufacturing firms finding themselves seriously injured by evils that have crept into the trade, determined to put a stop to them, if possible, and accordingly advertised a meeting of Hardware Manufacturers, to be held in New York on the 10th inst., when, perhaps, some amicable arrangement might be made that would be beneficial to all parties concerned. The meeting was accordingly held, and a committee appointed to draw up resolutions, but so much opposition was evinced, particularly on the part of the small manufacturers, who do not feel the evils complained of so palpably as the larger firms, that nothing determinate was resolved upon. The points at issue are the present system of long credit, the charges of freightage and insurance which are pre-paid by many large manufacturers, even for great distances, and the cost of packing cases, which are allowed by the manufacturer to the dealer. To remedy these grievances a series of resolutions were drawn up by the above mentioned committee and presented to the meeting for adoption, but they did not appear to meet with general approbation. The first, which was intended to fix the time of giving credit viz., 6 months, alone met with any hearing—the two others, for discontinuing the payment of freightage, and allowing packing cases to the purchaser, being entirely disapproved of. Even with regard to the first, there was much opposition evinced, and the Committee were compelled at last, from the difficulty of obtaining a hearing, to withdraw from the field. It may, therefore, be looked upon as a drawn game, neither party—the long credit nor the short credit—having obtained the ascendancy, for, from the noise and confusion, which we understand from a party present, was exhibited at the meeting, it would be impossible to determine whether the resolution was carried or not. It would, however, be advantageous to the trade—both buyer and seller—if some regular credit system were adopted, for the present mode of carrying on business is open to many serious objections—of which many manufacturers complain, as it appears to us, with justice.

It is no uncommon thing for a manufacturer to date an invoice of goods sold, three or six months forward, in addition to the customary six months' credit of the trade, so that he actually gives nine or twelve months' credit, and sometimes longer, when, by right, the purchaser could only expect six months' time from date of purchase before payment would be due. This is a ruinous method of procedure, which cannot fail to be detrimental, not only to the party doing so, but likewise to other dealers. As a matter of course these latter, in self-defence, are obliged to do similarly, or, if they refuse such accommodation, they are liable to suffer from loss of business, the buyers complaining of their unaccommodating spirit, as compared with Mr. So-and-so or Mr. So-and-so.

Again, the charges for freightage and insurance are a heavy drawback on a business where manufacturing prices are so slightly remunerative as the hardware trade, and amount to a large item on the debit side of a manufacturer's books, when he is expected to pay the expenses of carriage as far as Albany or Buffalo, and even in some particular cases which we could point out, as far as New Orleans. Even the price of the packing cases, which are now allowed to the buyer, is a heavy item out of the manufacturers' profits, where the business is large, amounting, with some firms, to several thousand dollars yearly, —and although a small manufacturer, whose orders are few, may think to draw custom by making no charge for packing cases, yet it comes onerous where the orders are extensive. If we are not mistaken, in other lines of business it is customary for the purchaser to be at this expense; at all events, it would be of great advantage to those that are concerned in this trade, to come to some unanimous agreement upon these points—their differences can only injure themselves, and while they are pulling different ways, no good can arise. We are opposed to monopolies and cliqueism, but we are, nevertheless, of opinion that organization is necessary in all stages of society, and that both the manufacturer and the dealer, the seller and the purchaser, are benefitted by a regular system, where chicanery and unfair conduct cannot get the upper hand over the honest and straightforward tradesman. Let the hardware manufacturers, therefore, see to it—it is their affair to do so; and if the present meeting has been abortive, let them canvass the trade and call a general meeting again of hardware manufacturers from all parts of the Union.

White's Truck---Errata.

Mr. Hudson, of Patterson, the author of the late article on White's Truck, on page 163, writes unto us stating that there were several errors printed by us not in his letter, which he wishes us to correct. We will correct them, but beg to state that his letter was carefully read with the proof, and the blame is not ours. The article says "his truck ought to be compared with such as are calculated for *even* (read *uneven*) roads." Again, where it says "the centre bearing trucks put upon the Auburn and Rochester Railroad, by Eastwick and Harrison had eccentric centre pins," is not correct; it should merely have stated "that trucks having such centre pins were in use several years ago on the said road."

Inventors of Washing Machines to the Rescue.

Mr. James S. Gilliam, of Petersburg, Va., writes to us that he is desirous of purchasing some of the best washing machines that were ever invented. Mr. G. writes that he is the keeper of a large hotel, and desires machines that will do work on a large scale. We can do no better than to advise each of the three hundred washing machine patentees to address Mr. G. a letter setting forth the merits of their respective inventions.

For British Yachts.

An opportunity will be afforded next October for any of the crack British yachts to redeem the national laurels of Old England, which were lost in the race in which the "America" was the declared victor. The New York Yacht Club has offered a purse of $500, to be sailed for on the 18th of October next, over the usual route in our harbor. The prize is open for the yachts of all nations, and our friends across the Atlantic are affectionately invited to participate with us on that expected trying and joyful occasion.

We have received a letter from Mr. Wilson inventor of the tunnelling machine, which he says is successful, in contradiction to the extract in the "Scientific American" of the 5th inst. We will present the substance of his letter next week.

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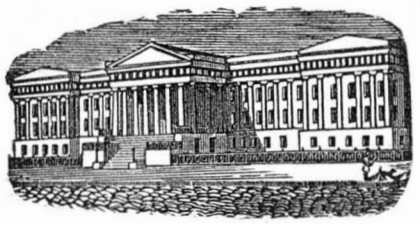

Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 8, 1853.

PURIFYING FATTY MATTERS—By J. B. Moinier & P. H. Boutigney, of Paris, France. Patented in France, Nov. 14, 1849: We claim the introduction and mingling of a current or currents, of sulphurous acid gas, with mixtures of fatty acids and alkalies, preparatory to the process of being converted into candles, tapers, and articles for burning, thereby rendering such mixtures of a superior quality, and causing them to burn with a stronger, clearer, and brighter light.

HOT AIR FURNACES—By N. A. Boynton, of Boston, Mass: I do not claim a hollow ring radiator placed over, and made to communicate with the chamber of combustion; but I claim the hollow wheel radiator, made with a hollow rim, hollow spokes, a hollow hub (open at top and bottom), and a valve and valve seat so made and applied to the hub that when the valve is closed it shall cause the heat and volatile products of combustion pass through one or more of the arms and into and through the hollow rim, out of the said rim, through the other arm or arms, into the hub and over the valve, and also so that when the said valve is opened the heat and volatile products of combustion may pass directly up through the hub, without first calculating through the hollow arms and rim, as specified.

CENTRE-BOARD AND RUDDER FOR SHOAL WATER VESSELS—By Geo. Chase, of Prudence Island, R. I. I am aware that one rudder, made to slide within the other, and attached to a centre-board, has been used, so that one shall rise with the other, but in this case there is no indication by which it can be known, when the sliding rudder is up or down, and when used.

I claim attaching the rear end of the movable centre-board and the rudder to the sliding stern post, so that the said centre-board, stern post, and rudder, may be raised or lowered together, substantially as described, and by which means I only use a single rudder, whose position can always be known by the height of the stern post to which it is hung, as also that of the centre-board, the sliding stern post serving as an indicator of the positions of both.

HANGING FARM GATES—By John Filson, of Milroy, Pa.: I claim the lower double-jointed hinge, in combination with the apparatus attached, and constituting the upper hinge, as described, for the purpose of holding the gate at any inclination required, for the purposes set forth.

CORE-BARS FOR CASTING PIPES—By Geo. Peacock, of West Troy, N. Y.: I claim the core bar having transverse wings or projections of a semicircular or other shape, corresponding to the shape of the article to be cast, said wings or projections permitting the sand to be rammed, for forming the lower half of the core, and holding or binding the sand to the lower part of the bar, and allowing the upper half of the core to be made by the sweep, as set forth.

Also the manner of anchoring the core bar, as described, viz., by means of the metal strips or bridges fitting in recesses in the upper surface of the core-bar, said bridges resting upon wooden supports, and having anchor rods bearing upon their upper surfaces, the liquid metal burning out the wooden supports and allowing the core to be withdrawn, by which means the core is prevented from being raised or forced upward by the liquid metals, as it is poured into the mould, and thus enabling pipes to be cast of any desired length.

Also the manner, substantially as described, of connecting or jointing the core bars, for forming cores for elbows or branch pipes, by means of wooden wedges, which are the means of holding the bars together while the core is being formed, said wedges being burnt out by the liquid metal, when poured into the mould, and allowing the cores to be withdrawn.

[See engraving of this apparatus in No. 13, this vol. Sci. Am.]

MOULDS FOR UNITING STEEL TO CAST IRON—By Chas. Peters, of Trenton, N. J.: I claim the use of a solid base to moulds, in which steel or wrought-iron is to be welded to cast-iron, with an aperture in the same, so that by means thereof the said steel or wrought iron can be subjected to the heat of the furnace while in the mould.

WINNOWERS—By G. F. S. Zimmerman, of Charlestown, Va.: I claim the invention, use, and application of the perforated vibrating table, arranged to a sloping bottom or platform, the parallel saw-like strips or straw pushers, combined with an oscillating rake and straw beaters or curved prongs, the whole combined and working with the oscillating hinged standard, and suspending straps, substantially as set forth.

I do not, however, claim the invention of a combined threshing, separating, and winnowing machine, but only such parts as are set forth.

GAS METERS—By E. R. Hallam, of New Haven, Ct., and T. B. Barnard, of Brooklyn, N. Y. (assignors to E. R. Hallam, of New Haven, Ct): We claim the method of constructing meters with one cylinder working within another, so that the gas passes alternately into the inner cylinder, and out of the space above it, and then out of the inner cylinder, while the supply enters the space above it, the gas being changed in its course or direction by valves, as described.

SURGICAL INSTRUMENTS FOR THE EAR, &c.—By H. Le Riemondie, of New Orleans, La. Ante-dated Oct 23, 1852: I claim the construction of an instrument for examining the interior of the ear, nose, eye, or other part of the human system, by the combination of the reflectors, the lens, case, tubes, and lamp, as specified.

The Crystal Palace.

The *soi-disant* Crystal Palace, by some called the "Putty Palace," to use a poetical quotation, "wends its *slow* way along." We have paid a second visit of exploration to this scene of future glories, but saw none of those signs of forwardness that might naturally have been expected after the Circular that has been issued by the Directors of the Company to intending exhibitors. In their Circular they state that exhibitors are to send in an account of the quantity of space they may require by the first of this month, and they may have had applications more than enough to fill the building, as we understand them to have stated to intending exhibitors; but we should have thought that it would have been time enough to put out this order when there were some signs of a building. In its present condition it can scarcely be expected that their call will be very promptly responded to: before an individual makes up his mind to entrust his property to another person's safe keeping it is natural that he should enquire where it is to be placed, whether it will be protected from the effects of the weather, and other unforeseen contingencies, all of which requirements must necessarily be first guaranteed. Reservoir Square, in its present state, can give no such protection, and unless a great deal more energy is evinced than we see at present exhibited, it is not likely to be in a proper state for the reception of articles, much less ready for public inspection by the 1st of May. Instead of employing only a few dozen workmen, as at present, we would advise the Company to put on some hundreds if they wish the building to be completed at the specified time. Otherwise, without pretending to any extraordinary wisdom, we will venture to affirm that the building will not be open even by the 1st of July. There is a dead-alive sort of look about the whole concern that we do not like—none of that bustle and animation that might naturally be expected, and we will wager anything that Genin's Bazaar, two months before opening, showed more tokens of a great enterprise than our World's Bazaar up town. What the motives of the parties interested may be we cannot take upon us to determine, but it is evident that they are not actually in a very great hurry, whatever pretensions they may put out to the contrary notwithstanding. A five years' lease, and perhaps another in perpetuo, will allow of a longer time for completing the building than by the first of May, and provided those that pull the wires can make the public dance to their tune, what do they care for the opinion of the world? A five years' lease for an object that must, if properly carried out, be only temporary, was almost as corrupt a job as the Broadway Railroad.

Riddle's Report of the Great Exhibition.

[Continued from page 174.]

FLAX.—This class, although embracing a variety of substances, was not an extensive one, the chief and most interesting features relative to vegetable substances having been those comprised in the growth and manufacture of flax and hemp, including preparations by Claussen's patent.

Of the flax plant there are several varieties in cultivation, the best seed coming from the Riga and Holland. As the different varieties arrive at maturity at different times, and the stem rises to different heights, it is very essential that the seed be not mixed, as this would occasion great inconveniences and loss in the pulling of the flax. The most common variety of flax in Great Britain is of a moderate length, with a strong stem. If it is not sown very thick, it will throw out branches at the top, and produce much seed. It is, therefore, a matter of calculation whether it will be most profitable to have finer flax, with less seed, or an inferior quality of flax and an abundance of seed. There is a small variety which does not rise above a foot, grows fast, and ripens its seed sooner. When the principal object is to get linseed, this variety is preferred; but the flax is shorter, and also coarser.

The soil best adapted to the growth of flax is a deep, rich loam, in which there is much vegetable mould. It should be yellow, and loose to a considerable depth, with a sound bottom, neither too dry nor too moist. Either of these extremes invariably destroys the flax. It is, therefore, not suited either to hot gravelly soils, or cold wet clays; but any other soil may be so tilled and prepared as to produce good flax. The land should also be free from weeds, as the weeding of this crop forms a very important item in the expense of cultivation. These circumstances suggest the following mode of preparing the land:—A long fallow, including two winters and a summer, will be a good preparation for the heavier loams, which should be trenched plowed, and worked deep. The manure generally used is rotten dung, or a compost of earth and dung, or some artificial dressings.—If the land is sufficiently clean, a crop of potatoes, well manured, may be substituted with advantage for the fallow. Flax has also been found perfectly successful, when grown after clover, on a single plowing, especially if the clover be biennial. The stubble of the clover is plowed up, either in the spring or autumn, with some care, and then the harrow and roller are passed over the ground before sowing. If the soil contains a great portion of clay, lime may be used with advantage; but in the lighter loams it may be dispensed with. At all events, it should not be used immediately before the flax is sown, but for some previous crop. Peat ashes make an excellent manure, as they improve the soil and keep off insects, which are apt to injure the root of the flax. For the want of peat ashes, those made by the burning of weeds and earth in a smothered fire are a good substitute. There is another manure, also, which has been found to answer exceedingly well, composed of the sweepings of streets in towns, mixed with night soil. Where night soil cannot be obtained in sufficient quantities, rape cakes, from which the oil has been expressed, dissolved in cows' urine, form a very excellent manure.

When the flax begins to get yellow at the bottom of the stem, it is time to pull it, if very fine flax is desired, such as is made into thread for lace or fine cambric; but then the seed will be of little or no value. Every flax-grower judges for himself what is most profitable on the whole. The pulling is done carefully by small handfuls at a time. These are laid upon the ground to dry, two and two, obliquely across each other. Fine weather is essential to this part of the operation. Soon after this they are collected in larger bundles, and placed with the root end on the ground, the bundles being slightly tied near the seed end. The other end is spread out, that the air may have access, and the rain not damage the flax. When sufficiently dry they are tied more firmly in the middle, and stacked on the ground till the next season. Some carry the flax, as soon as it is dry, under a shed, and take off the capsules with the seed by rippling. Sometimes, if the capsules are brittle, the seed is beaten out by means of a flat, wooden bat. The flax is then, according to the usual process, immediately steeped. By Claussen's invention, this method, to a certain extent, is dispensed with, the pure fibre being more easily and rapidly separatd from the wood. As this process has excited great attention, both in this country and Europe, it is certainly deserving of a fair trial. In order to explain it as far as possible, we cannot, perhaps, do better than to use the Chevalier's own words.

[Here follows a very long article from the "Morning Chronicle;" a pamphlet published by Mr. J. Wylie, of this city, contains a far better description of the process. It appears to us that our Commissioner's information on such an interesting subject as flax should not be second hand. The Claussen flax cotton, after all, it turns out now, cannot be spun on cotton machinery.

SPECIMENS OF WOAD.—This plant was once cultivated to a great extent for the blue dye extracted from it, but has been greatly superseded by indigo. It might still be cultivated to great advantage, as it improves the color of indigo when mixed with it in a certain proportion. The plants, when just about flowering, are mown with a scythe, washed with water and sun dried; after this they are ground into a paste, which, kept in heaps for about a fortnight, is then formed and pressed into solid balls. It is also occasionally sown as food for cattle, and has lately been recommended for this purpose under the name of pastel. Its vigorous growth and hardy nature are in its favor; but it will only flourish in very rich soils.

[The Woad Plant, we believe, is cultivated in some parts of the United States.

Recent Foreign Inventions.

OLD FABRICS MADE INTO NEW.—L. F. Vandelin, of London, patentee.—The operation of converting old fabrics into fibres for being again employed in manufacturing woven goods has been hitherto performed on such fabrics whilst in a dry state, by which means the fibres were in a great measure injured or destroyed. The loss resulting from this process the patentee now proposes to obviate by operating on the fabrics whilst wet, so as to enable the fibres composing them to be drawn out or untwisted, instead of being broken, as heretofore. The materials are cut into pieces of from 2 to 8 inches square, and subjected to the action of machinery which is similar to that used by paper-makers, two beating wheels and plates of teeth being provided in the same trough, and a stream of water kept constantly flowing through it.—When operating on silk rags, the water should be used at a temperature of about 80 degrees, when a small quantity of soft soap may be advantageously introduced into it.—In conclusion, the patentee states that the mode of operating may be varied, so long as the peculiar character of the invention, that of treating old fabrics in water so as to separate their fibres into a state to be again used with other fabrics by spinning and weaving be retained.

NEW GUTTA PERCHA COMPOSITION.—Alfred H. Gaullie, Paris, patentee.—This improved composition is formed by mixing together equal parts of gutta percha and of Roman cement reduced to a pasty consistence with ox-gall. The operation of mixing is to be performed while the gutta percha is in a heated and plastic state, and the two ingredients must be well masticated so as to cause them to combine intimately together. Any kind of coloring matter may be combined with the materials according to the effect desired to be produced.

WORKING STEAM EXPANSIVELY.—John H. Johnson, of Glasgow, patentee.—The improvement has a relation to working steam expansively, and consists in arranging the cylinders of an engine in such a manner that after the steam has acted by high pressure on a piston of small area, it is admitted alternately into two larger cylinders, whose pistons it shall move by its expansion, but the stroke of which shall be only half the length of the high pressure cylinder.

[At the present day there are many *improvements* in steam engines which look like marching backwards in the history of invention.]

TANNERS' GREASE.—William Tanner, Exeter, Eng., patentee. (Well named.)—These improvements consist in using blubber combined with cod liver oil for dressing leather. The blubber is first melted by the application of heat, which should not exceed 130 to 140 degrees Fah., and an equal quantity of cod liver oil is then introduced, and well-stirred in order to incorporate it thoroughly. The mixture should be used at a temperature of about 70 to 80 deg. Fah., and well stirred previous to removing any portion of it from the vessel in which it is contained. For thick skins, the proportion of blubber must be reduced, as they do not so readily absorb the mixture as thinner ones, for dressing which a larger proportion of blubber than that above stated may be employed.

NAPPING CLOTH.—Wm. Murdock, of Holborn, Eng., patentee.—This improvement consists in subjecting milled or fulled woolen fabrics to an operation of beating, whereby the exterior fibres will be brought to an upright position, forming a pile, which is to be reduced to a uniform length by shearing. The beating is performed by rods striking the fabric across its length whilst in a wet state; and as the pile is only raised on each side of the part struck by the rod, care must be taken to shift the fabric gradually, so as to bring a fresh portion of it constantly under the action of the beating-rod. The operation may be repeated if the pile is not sufficiently raised by a single treatment.

[Condensed and selected from the "London Expositor," "Mechanics' Magazine," "Artisan," "Repertory of Inventions," and "Genie Industriel," Paris.

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TO CORRESPONDENTS.

R. S. B., of Ohio.—Well, you are a good-souled fellow, we believe. We wish you had a copy of Lieut. Maury's Winds and Currents of the Ocean. See page 131 of Scott Russel on Steam, and you will find ice set down as having 140 deg. latent heat.

A. C., of Ct.—Your furnace appears to be a good one.

F. R. Van T., of O.—You may order a copy of Minifie's drawing book through us Price $3—postage by mail about 40 cents, which must be prepaid.

C. W. B., of Mass.—You need not send us any more money for a copy of the Patent Laws, for we will send you one surely, as soon as we get them printed.

J. M. G , of ———.—Your case water wheel is the same as a rotary engine described in Vol 4, Scientific American.

S, B. S., of Vt.—We do not find that any patent has been granted to the Messrs. Douglass during the past three or four years, but it is presumed that they may own a recent patent by assignment.

E. P., of Ind.—You are under a wrong impression if you suppose we are ever pecuniarily interested in inventions. We cannot recommend any party to you that would be willing to advance money to introduce an invention, unless the matter was fully explained and promised very flattering results.

N. W., of Pa.—So far as we are able to judge from your sketch, the rudder is new and, we presume, patentable.

G. H., of Va.—Your suggestion about the construction of railroad trucks, and the dispensing with the axle, etc.; is not new.

J. C., of Pa.—Lamps are in common use which burn fluids without the aid of a wick.

J. O. H., of Miss —We have sent you a copy of Ranlett's Architecture, but Arnott's cannot be obtained by the single number.

J. B. P., of Ga.—It is certain that you and Mr. H. cannot both obtain patents, the inventions are so nearly identical, and it is a matter of a good deal of doubt if either do. We think your position is the best, for you have not been to the expense that Mr. H has.

P. M R., of Ala.—The machine advertised in our columns is as good as any in use; the knife works in a grate which slides in a vertical frame, and the block is fed to the knife in a vibrating carriage, which gives the proper taper to the shingle. The price of a large sized machine is $120.

B. B., of Md.—Your clover sheller appears to be very simple, and we think would work very economically for small uses. Should you wish to patent it we shall require a model and the Patent fee, $30, in the first instance. We are puzzled to make out your name from the signature.

T. H , of Pa.—Your bolting apparatus appears to be useful and new. We think a patent can be secued for the improvement. Please send us a model.

S. N. B., of Ohio—We know of no concern that would contract for constructing a locomotive of so small capacity as a 4 horse power.

W. G. H, of Pa.—Your composition for roofing would not be patentable. We have had no tidings from your case since the application for a patent was made.

F.D.P., of Mass.—There is a bill now before Congress for the better protection of Inventors, and we are waiting for it to become a law before we issue our new edition of the Patent Laws, so that we may introduce it in our work, and thus render our edition as complete and reliable as the one issued by the Patent Office. We will send you a copy as soon as any are ready for the mail, and that will depend on the action of the officials at Washington.

M. S., of N. Y.—We have never heard of such an apparatus as that which you describe for the resuscitation of drowned persons: it commends itself to us.

P. M. H., of N. Y.—We "caught your idea," but do not think it a patentable one; if you could prove priority of invention you might possibly obtain a patent on the whole thing, but we think you would not be able to secure a patent on the improvement you have made.

L. G., of N. Y.—We have had a model of a car brake in our office for two years past, which is constructed on precisely the same plan as yours.

R. H. C., of San Francisco—It might gratify you to have an illustration of your machine appear in our columns, but we don't think it would be a subject of general interest to our readers, therefore decline your proposition.

C. D., of Mass., and others—We have not all the back numbers, even to Jan. 1st, with which we can supply you: your subscription we have entered from the present date.

W. C. G., of N. Y.—We are at a loss to discover any thing new or patentable in your device to be employed as a guard in front of locomotives. If there is any particular point of novelty you are at liberty to direct our attention to it, as it now stands we cannot encourage an application for a patent, as it is a mere change in form.

C. C. C. S., of Mass —We cannot undertake to say what the value of any invention would be, especially a steam valve, it may be new, but of this we are doubtful. The Patent Laws we shall send you as soon as we have an edition through the press.

J. V. S , of N. J.—We saw a model some two years ago of a switch substantially the same as yours: we cannot therefore advise you to make an application for a patent.

S. T. C., of Mo.—We do not know of any new edition of Evans's old work on Millwrighting. We have disposed of your letter as directed.

Money received on account of Patent Office business for the week ending Saturday, Feb. 12:

J. C., of Ga., $55; J. & C. D., of Pa., $30; H. W. W., of N Y., $40; R. S., of N. J., $25; C. D. C., of Mass., $35; T. T. W., of N. Y., $45; J. I. V., of N. Y., $30; D. S., of Pa., $10; A. R., of Pa., $10; C. J., of R. I., $72; C B., of Ohio, $50; L. D., of N. Y., $30; A. M. S., of Ala., $30, S. T. S., of Mass , $25. S. A & J. G., of R. I., $30; B. I., of L. I., $25; J. B. D , of N. Y., $20; E. G. H., of N. Y., $25; P. G, G., of N. Y., $55; C. S. B., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday Feb. 12:

E. C. B, of N. Y.; C. S. B., of N. Y.; J. & C. D., of Pa.; E. St. L., of N. Y.; E. G. H., of N. Y.; J. B D., of N. Y.

A Chapter of Suggestions, &c.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:—Of Volumes 1, 2 and 3—none. Of Volume 4, about 20 Nos., price 50 cts. Of Volume 5, all but four numbers, price, in sheets, $1. Of Volume 6, all; price in sheets, $2; bound, $2,75 Of Vol. 7, all; price in sheets, $2; bound, $2,75. Of Vol. 8, none.

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American and Foreign Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

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COCHRAN'S CRUSHING MACHINE—Can be seen in daily operation in Thirteenth street, between 9th and 10th avenues. Parties in want of a machine for crushing and pulverizing quickly and cheaply Quartz Rock, Iron, Lead, Copper, and Silver Ores, and other mineral substances equally hard, are invited to witness the operation of these powerful and simple, but yet effective machines. For further particulars apply to E. & J. BUSSING & CO., No. 32 Cliff st., Y. N. 23tf

TO CLOTH MANUFACTURERS AND FULLERS—An experienced German Dyer (well in English) continues to give fair instruction in managing a warm blue vat. Address F. MARWEDEL, 524 Grand st, N Y. 23 2*

TO ARCHITECTS, BUILDERS, AND OTHERS—Messrs. WATSON & HODGSON, Modellers, Designers, &c., respectfully intimate that since they have commenced business they have completed a house, the property of Charles Morgan, Esq, No. 4, Madison Square, north side; any of the above parties may call and see their first essay before the New York public. Decorations of every period, style, and character, accurately executed to order. Place of business 494, basement, and 374 Broadway, up stairs. 23 3*

WATER POWER TO LEASE—We have a surplus of from 6 to 8 horse-power, which we wish to have occupied; is well calculated for a machine shop or any similar business; room 29 by 48 feet, light and airy. Terms $150 per annum. Address E. & T. W. SHAW, Spring Valley, Green Co., Ohio. 23 2*

COTTON MACHINERY—Of the most approved plans, from the best shops in the country:—drawings, specifications, and general arrangements for the machinery, furnished at the lowest rates, by W. B. LEONARD, and E. W. SMITH, 75 Merchants' Exchange, New York. 23tf

BLACK LEAD CRUCIBLES and Melting Pots of any form, size and quality, made to suit customers, for 3 cents per number, and warranted equal to any of the kind manufactured in the world, by D. H. PURINTON, Somerset, Mass. 23 10*

CLOCKS FOR CHURCHES, COURT HOUSES AND OTHER PUBLIC BUILDINGS, Time-Pieces for Session and Vestry Rooms Hotels, Rail-Joads etc.; Regulators for astronomical purposes, Jewellers, and others, when the most perfect time is desired. The improvements introduced by the subscribers, enable them to warrant an accuracy of time-keeping, unequalled (so far as they can learn) in Europe or America. Glass dials, for illuminating and other kinds, furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island.

"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world."—[Scientific American. 19 13eow

SHINGLE MACHINE—WOOD'S PATENT—JAS. D JOHNSON, of Bridgeport, Conn., proprietor of this justly celebrated machine, is now on a tour through the South-western States, and will exhibit the machine in operation in the principal towns and cities. Notice will be given in the local papers where and when it may be seen; he will dispose of machines and rights upon reasonable terms. 20tf

WANTED—A second-hand Surfacing Machine, in good working order—Woodworth's Patent. Any person having such a machine for sale will please address STARR & STEVENS, Danbury, Conn. 23 3*

THE UNDERSIGNED manufacture Patent Cast-Iron Screw Pipes, of 3-4, 1, 1 1-4, 1 1-2, 1 3-4, 2, 2 1-2, and 3 inches in diameter—now in extensive use for gas, steam, and water, being cheaper and more durable than copper, lead, or wrought-iron pipes, and available for the same purposes. This pipe has been largely used in conducting water to railroad stations, also in tanneries, distilleries, pork and sugar houses, in conducting water or steam, and as suction pipe for pumps, for which, where long lines are required, it is peculiarly fitted, from its durability, cheapness, and the excellence of the screw-joints. We also make Solid Hub Railroad Car Wheels, by Murphy's process, using the utmost care in selecting metal for the purpose, with reference to strength and chilling properties. Also small steam engines, mill machinery, cotton presses, tobacco-screws and presses, lard, timber, and mill screws; force and lift pumps of various sizes and kinds, for hand use or power. Cast-iron railing. Roys & French's Patent Hub Mortising Machine, which will lay off, bore, and mortise a hub of ordinary size in 15 minutes, turning it out completely finished, the mortises having any required disc.

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WOODWORTH PLANING MACHINES, ON hand and manufactured to order, of superior quality, at reduced prices, warranted perfect. Also steam engines and other machinery, by JOHN H. LESTER, 57 Pearl street, Brooklyn, L. I. 22-8*

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"Since I have been a subscriber to your paper I have purchased one of your Mortising Machines, for which I would not take double its price and do without it. WM. M. FLEMING,
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This machine is simple, durable, and effective, and is boxed and shipped for the low sum of $20
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OLIVER'S WIRE WORKS—No. 25 Fulton st, corner of Water. Locomotive Spark Wire, Patent Self-Setting Revolving Rat Traps; a new invented enclosed Coal and Ash Separator, and Wove Wire of every description. 21 3*

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APPLICATION will be made to the Commissioner of Pensions for a duplicate of Land Warrant Certificate No. 63,062, issued by the Department in 1849, to Roxena, widow of Silas Salsbury, late of 2nd U. S. Infantry; said warrant was assigned by her to E. C. Church, and by him to me Oct. 1st, 1849, and was stolen from me the 16th January, 1852, at the Hudson R.R. Depot, New York City.
CHARLES D. NIMS.
January 24th, 1853. 21 6*

MACHINERY, TOOLS, &c.—The subscriber is prepared to manufacture all kinds of light machinery, also Lathes, Slide-rests, and Engineers' Tools, &c., at short notice and on moderate terms. Engineers and inventors giving him a call will have their work got up with accuracy and despatch.
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20 12* EDWARD HARRISON.

W. P. N. FITZGERALD, Counsellor at Law has recently resigned the office of principal Examiner of Patents, which he has held for many years, and is ready to assist, professionally, in the preparation and trial of patent causes before the U. S. Courts in any of the States, and before the Supreme Court of the United States. He also acts as Counsel in cases before the Patent Office, and on appeals therefrom, but does not prepare applications for Patents Office corner of E and 8th sts., Washington, D. C. 18 tf

PATENT DRAFT BOARDS—With extension scales, sheet fasteners, and T rule. See Reports of Worcester Fair, Maryland State Fair, &c. &c, with their awards. $10 complete. Sent by express. Address, post-paid, CHAMBERLIN & CO., Pittsfield, Mass. 16tf

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A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 16tf

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NEW HAVEN MANUFACTURING COMpany, Tool Builders, New Haven, Conn., (successors to Scranton & Parshley) have now on hand $25,000 worth of Machinist's Tools, consisting of power planers, to plane from 5 to 12 feet; slide lathes from 6 to 18 feet long; 3 size hand lathes, with or without shears; counter shafts, to fit all sizes and kinds of universal chuck gear cutting engines; drill presses, index plates, bolt cutters, and 3 size slide rests. The Co are also manufacturing steam engines. All of the above tools are of the best quality, and are for sale at 25 per cent. less than any other tools in the market. Cuts and list of prices can be had by addressing as above, post-paid. Warehouse No. 12 Platt st., New York, S. C. HILLS, Agent N. H. Man'g Co. 19tf

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SCIENTIFIC MUSEUM.

A Simple Barometer and Storm Pointer.

MESSRS. EDITORS.—Your notice in a late number ot the "Scientific American," of the Typhoductor or Storm Pointer, exhibited by Colonel Lloyd, called to my remembrance a simple contrivance, which, though not by any means new, may be so to many ot your readers, and as the experiment involved is a simple one, and easily made, it may be practically tested by all who have any doubt as to the truth of it.

"Put two drachms of pure nitre and half a drachm of chloride of ammonia, reduced to powder, into two ounces of pure alcohol, and place this mixture in a glass tube, of about ten inches long and proportionate diameter, the upper extremity of which must be covered with a piece of skin or bladder, pierced with small holes. If the weather is to be fine, the solid matters remain at the bottom of the tube, and the alcohol is as transparent as usual. It rain is to fall in a short time, some of the solid particles rise and fall in the alcohol, which becomes somewhat thick and troubled. When a storm, tempest, or even a squall is about to come on, all the solid matters rise from the bottom of the tube, and form a crust on the surface of the alcohol, which appears in a state of fermentation.—These appearances take place twenty-four hours before the tempest ensues; and the point of the horizon from which it is to blow, is indicated by the particles gathering most on the side of the tube opposite to that part whence the wind is to come."

When, where, or by whom this discovery was made I do not know; it is simply matter of history to me; but an old *Salt*, resident in Virginia, whose instrument was not the most neatly fitted, asserts, from many years' experience, that he has never known it to fail, either as a barometer or storm pointer. The rise and fall ot the sediment by atmospheric change may be readily conceived, but what subtle influence can there be which causes it to collect twenty tour hours previously, on the side opposite to that from which is the impending storm? Are we to suppose that the particles are so nicely sensitive as to be affected by the slight difference which may exist in density of the atmosphere, on the one side of the tube over that on the other, in the transition or disturbance of equilibrium, which is being effected by the progress of the atmospheric change in the direction of, and as produced by the coming storm? Or may there be some electrical influence at work? The causes, however, I shall not pretend to determine; these may form a subject of enquiry for others better versed in the theory of storms than I am, but in presenting the experiment to your readers, I hope that it may not fail to interest a few. G.

January 31st, 1853.

Machine for Planing Sash-Stuff.

E. C. Bennett, of Binghamton, N. Y., has taken measures to secure a patent for the above. This machine is adapted for planing sash and door mouldings, and also for finishing slats for window blinds. It is furnished with two cutter stocks and other suitable gearing, in order that the two separate processes we have mentioned may be in operation at the same time. Or if desired, the sash strips can be rabbetted, and then, as delivered can be put in on the opposite side and finished. The more peculiar parts of the arrangement consist in the self acting mode of supplying the strips and slats to the bed, and in feeding them up to the cutters; also in the plan ot giving the bed the necessary reciprocating motion by a tailed segment, which gears into a shifting rack, so that as the segment is impelled by a couple of pins (suitably placed), the change of motion is transferred to the rack, which thus shifts the driving band alternately on to two pulleys. There is another contrivance well worthy ot note, and that is a plan for planing the bottom of the rabbet after it has been shaped, so that it is made quite smooth. This is done by setting the last of a series of cutters in an inclined position, so that it smooths the roughness caused by the preceding cutters.

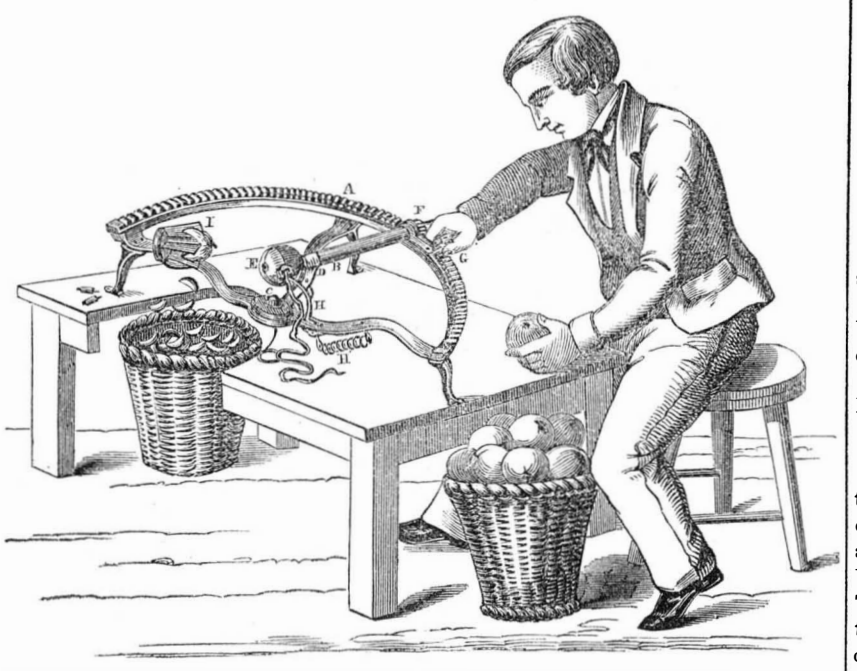
The operation of the machine is as follows: —receptacles or "wings" are filled with slats or sash strips, a weight suspended by a cord is so adjusted as to cause one strip to be fed on to the bed, which proceeds with it to the left end of the machine, a catch now strikes the stuff and drives it under the elliptical springs and against the cutters, the springs being intended to maintain the stuff in position. A similar weight in the other receptacle or "wing" forces another piece on the bed, which is caught and carried to the right end of the machine when the process we have described is repeated.

The Great Pyramid.

The Great Pyramid in Egypt is 800 feet in height, and its base occupies thirteen acres. Its weight is estimated at six millions of tons, and its erection would occupy 3,000 men twenty years. If it was broken up, the materials would rear a wall around the whole empire of France ten feet high and two and a half feet thick.

The journeymen masons in Elizabethtown have resolved to ask of their employers $1,75 per day from the 15th of March to the 25th November.

IMPROVED APPLE PARING MACHINE.---Fig. 1.



The annexed engravings represent a new and useful machine for paring, coring, and quartering apples, which is also applicable tor purposes of a similar nature where the first operation is only required, and is owned by N. E. Smith & R. W. Fenwick, of New York City, to whom the entire patent has been transferred by W. H. Lazelle, the inventor. Patented Jan. 25, 1853.

Figure 1 is a perspective view of the machine, and exhibits the manner of performing the above-mentioned operations. Figure 2 is also a perspective view of the machine on a larger scale, showing the same more clearly.

This machine consists of a semicircular stationary rack, A, having a hollow traversing lever, B, which turns on an axis, C, and is moved horizontally back and forth by means ot the handle, G, and pinion, F, which latter gears into the teeth of the rack, A. The pinion, F, is fixed to the outer end of a hollow spindle, which turns freely inside the hollow lever, B, and has at its other end a flanged fork, D, on which the fruit, E, is placed to be pared. Supposing the fruit to be as represented, on the end of the fork, and the handle, G, moved round from left to right to the position shown in figure 2, the apple will be nearly pared by the stationary swinging knife, H, which is kept up in contact with the apple by the spring, H′.

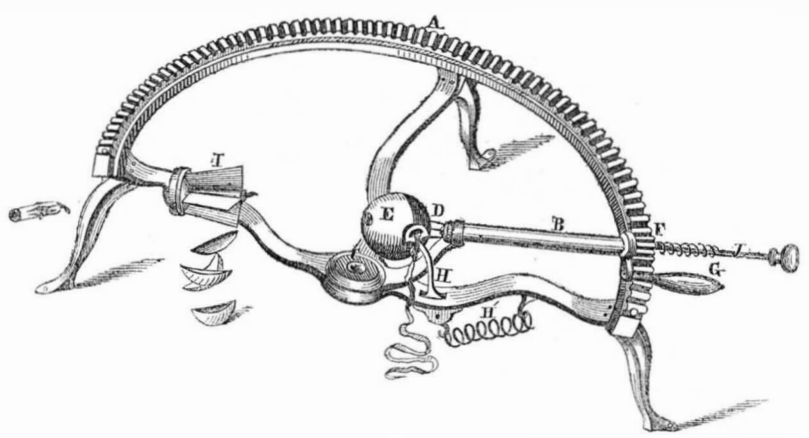
As the lever is moved in a horizontal direction, as described, the prongs of the fork and also the apple, will traverse a semicircle, and the knife, H, will act longitudinally from the blossom to the stem end of the apple. By the pinion, D, being made to traverse the rack the spindle attached to the pinion gives motion to the fork, and thus the latter is made to revolve with a rapid motion against the knife, H. Thus it will be seen that the apple and the fork have two motions—one in the path of a horizontal circle, and the other describing vertical circles. The swinging knife, H, being allowed to yield, and yet being firm and flexible, by means of the spring, H′, renders it very efficient and accommodating for apples of different sizes and of unequal surface, and also obviates the great wear and tear from the excessive tension that is necessarily exerted in the old machines on the spring, which is drawn out, as the knife traverses over the semi-diameter of the fruit. The apple being pared, and the handle drawn to the extremity of the rack, the machine is in a position ready for coring and quartering, the apparatus for performing these operations consists ot a coring rod, J, which passes through the fork, F, having a button at its outer and a collar at its inner end, in which latter is fixed a single prong that serves for holding the apple while being pared, and then retains it when it is knocked off the fork, D, after having been pared, in order to be cored and quartered. For the purpose of effecting the last-named objects, the coring rod, J, is forced by the hand against the cutter, I, which consists of a hollow tube furnished with four knives. The number of these latter may, however, be increased to any extent when it is desired, instead of quartering, to slice the apple for drying or other objects.

After the apple has been cored and quartered, the rod, J, is allowed to return to its original position by means of a spring in the outer end, between the button and the pinion, F, the said spring being compressed as the rod is forced against the cutter, I, and resuming its former position when the hand is withdrawn—the apple and core falling into proper receivers.

This machine presents manifold advantages over anything of a similar nature, both with respect to cheapness, durability, and also saving of labor as well as time, it being capable of performing almost double the amount of work in a given time than can be done by any other. Among its advantages is the use of a traversing handle instead ot a crank, by which it has a horizontal instead of a rotary motion, thus rendering the operation quicker and also easier to be effected. All the parts of this machine can be made as strong as desired, and not one of them is liable to get out of order. It is a machine that will endure without requiring to be repaired for a great number of years, and it pares apples with great rapidity and with astonishing precision. A silver medal was awarded to the inventor at the last Fair of the American Institute.

Applications for State rights, which will be granted at a moderate price, and for machines to be made to the sole proprietors, N. E. Smith and R. W. Fenwick, 14 Vandam st., N. Y.

Figure 2.



Cure for Potato Rot.

The "Chicago Daily Times" announces that one of the citizens of Michigan has discovered the cause and cure of the potato rot; and that General Cass has certified to the fact. What that discovery is we are not informed. The "Times" does not appear to know that the same discovery has been and is now claimed by more than one citizen of New York. No certificate, however, will satisfy us; we want to know what the *discovery* is, and judge of it upon its own merits.

Porcelain Manufacture.

Some two hundred girls, all Americans, are employed in ornamenting and finishing porcelain ware in this city. All of them, except four, are employed in the process of burnishing the gold after it comes from the furnace, and the painting is all done by experienced male artists. The gilding of china ware is done in New York to a considerable extent. Importers find it cheaper to buy the white ware in France and England, and have it ornamented in this country. The duty on the increased value of the ware is thus saved.

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